

DOCKET NO:

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF

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: EXAMINER: THURMAN WHEELER

SERIAL NO:

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FILED:

: GROUP ART UNIT:

FOR:

:

DECLARATION

COMMISSIONER FOR PATENTS  
ALEXANDRIA, VIRGINIA 22313

SIR:

Now comes Ugo Bianchi, who deposes and states as follows:

1. That I am an inventor of the above-identified patent application.
2. That I am familiar with the claims pending in this application and with the references applied against the claims.
3. That I and my co-inventor, Roberto Garaffa, have discovered (and solved) a problem not previously recognized in the field - that, in the preparation of liquid formulations with a high concentration of imidoalkanepercarboxylic acids in either the absence of surfactants or in the presence of anionic surfactants, starting with peracids in  $\alpha$  form and in the stage for conversion of the acid from the  $\alpha$  form to the  $\beta$  form, the viscosity of the preparations increases uncontrollably and the formulation converts from an aqueous dispersion to a mass of pasty consistency. This pasty mass cannot be used as a liquid



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formulation and cannot take advantage of the bleaching and disinfecting uses of imidoalkanepercarboxylic acid dispersions.

4. We the inventors have solved this unrecognized problem by providing and using an aqueous dispersion containing water, 7% to 40% of at least one imidoalkanepercarboxylic acid in the  $\beta$ -crystal form having the general formula (I) of the application, and from 0.005% - 0.3% of a nonionic surfactant. This dispersion, contrary to those with no surfactants or with anionic surfactants, provides a dispersion that is useful as a liquid formulation and that has a viscosity of not more than 2000 mPa.sec at 25°C, a dissolution time that is not more than 5 minutes at 40°C or more than 15 minutes at 18°C, and a stable viscosity that does not vary by more than 300 mPa.sec at 40°C for seven days.

5. Cavallotti, EP 0780374, cited against the application, makes imidoalkanepercarboxylic acids and is interested in providing these acids with a relatively constant water content of 8-12% (page 2, lines 36-37, page 4, lines 55-57, page 5, lines 19-21). He found out that he can do this by melting an imidoalkanepercarboxylic acid in excess water, making a eutectic imidoalkanepercarboxylic acid/water mixture, and decanting. See, e.g., Examples 1-7 at page 5, lines 56ff. "Sequestering substances" can be added, none of which are nonionic surfactants. See page 5, lines 10-15 of the reference. Notably, the final product imidoalkanepercarboxylic acid only contains approximately 10% water, 90% imidoalkanepercarboxylic acid.

6. Cavallotti is just like the prior art described in the application - it describes imidoalkanepercarboxylic acids in water in either the absence of surfactants or in the presence of anionic surfactants (Cavallotti's sequestering agents are carboxylic acids) whose viscosity would increase uncontrollably and convert from an aqueous dispersion to a mass of pasty consistency just like the references described in the specification.



7. There is no reason one of ordinary skill in the art would modify Cavallotti by adding a nonionic surfactant, because adding a surfactant would render Cavallotti's composition unsatisfactory for its stated purpose and would change the principle of operation of the reference, as the added nonionic surfactant would at a minimum hinder the separation of the eutectic composition from the water and make decantation more difficult if not impossible because decantation, which is Cavallotti's method for separating the eutectic mixture, depends on phase separation and the addition of a nonionic surfactant would be expected to tend to homogenize the phases.

8. That in the above-identified application Claim 1 relates to a liquid formulation of imidoalkanepercarboxylic acid in the form of an aqueous dispersion comprising water and, in percentages by weight relative to the total weight of the dispersion from 7% to 40% of at least one imidoalkanepercarboxylic acid in the  $\beta$ -crystal form having general formula (I) of the application and from 0.005% - 0.3% of a nonionic surfactant. This amount of nonionic surfactant represents an optimum - if the content of the nonionic surfactant is increased, it dissolves the imidoalkanepercarboxylic acid, like  $\epsilon$ -phthalimidoperoxyhexanoic acid (PAP), and the stability of dissolved imidoalkanepercarboxylic acid is much lower than that of crystalline imidoalkanepercarboxylic acid. So in our case, increasing the amount of nonionic surfactant decreases stability. In the range of 0.005% - 0.3% of a nonionic surfactant we have an optimum: essentially no decrease in stability but enhanced rheology.

9. That increasing the amount of nonionic surfactant beyond the amount claimed decreases stability is shown in the following supplemental examples, where PAP is  $\epsilon$ -phthalimidoperoxyhexanoic acid:



preparation containing: 17% PAP, 0.1% non ionic surfactant				
STABILITY TEST AT 40° C				
DD/MM/YY	14/01/10	21/01/10	11/02/10	11/03/10
WEEKS	0	1	4	8
PAP LEVEL (%)	17.07	16.89	16.78	16.22

preparation containing: 17% PAP, 2% non ionic surfactant				
STABILITY TEST AT 40° C				
DD/MM/YY	14/01/10	21/01/10	11/02/10	11/03/10
WEEKS	0	1	4	8
PAP LEVEL (%)	17.11	16.52	14.75	12.39

preparation containing: 17% PAP, 4% non ionic surfactant				
STABILITY TEST AT 40° C				
DD/MM/YY	14/01/10	21/01/10	11/02/10	11/03/10
WEEKS	0	1	4	8
PAP LEVEL (%)	16.95	16.12	13.63	10.31

As shown by these results, increasing the amount of nonionic surfactant to 2% or 4% (second and third entries) showed significant degradation of the imidoalkanepercarboxylic acid over 8 weeks, as compared to 0.1% nonionic surfactant (first entry). These results should be understood in combination with those already in the application using anionic surfactants, etc., all of which show a surprising effect, not taught in any art document of which I am aware, that an aqueous dispersion containing water, 7% to 40% of at least one imidoalkanepercarboxylic acid in the  $\beta$ -crystal form having the general formula (I) of the application, and from 0.005% - 0.3% of a nonionic surfactant provides a dispersion that is useful as a liquid formulation and that has a viscosity of not more than 2000 mPa.sec at 25°C, a dissolution time that is not more than 5 minutes at 40°C or more than 15 minutes at 18°C, and a stable viscosity that does not vary by more than 300 mPa.sec at 40°C for seven days.

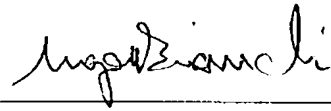
10. The undersigned petitioner declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believe to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under



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Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

Ugo Bianchi

A handwritten signature in cursive script, appearing to read "Ugo Bianchi", written over a horizontal line.

Signature

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Date